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We are indebted to Edward Miller, Esq. for the following Paper:—

CONSTITUTION

PROPOSED FOR THE

AMERICAN SOCIETY OF CIVIL ENGINEERS.

WITH

PROCEEDINGS IN REFERENCE TO THE SAME.

APRIL, 1839.

At a Convention of Civil Engineers of the United States, which met in Baltimore on the 11th of February, 1839, in pursuance of a call from a highly respectable meeting of members of the profession in Augusta, Ga., the following resolutions were adopted.

1. *Resolved*, That the Convention now proceed to the election of a committee of seventeen, to prepare and adopt a Constitution, and form a Society of Civil Engineers of the United States; and that in the opinion of this Convention, the said committee should be so selected, that all the different portions of the Union may be represented in it, so far as is practicable.

2. *Resolved*, That the committee meet at the Hall of the Franklin Institute, in Philadelphia, on the second Wednesday in April next, and that five of them constitute a quorum for the transaction of business, but that a majority of the seventeen expressing their assent by letter or otherwise, be required to adopt the Constitution.

The following gentlemen were then elected to form the committee. The name of Benjamin Wright, who was unanimously elected, being, by a resolution of the Convention, placed at the head of the list, and the remainder in alphabetical order.

BENJAMIN WRIGHT,	of New York.
WILLIAM S. CAMPBELL,	of Florida
CLAUDE CROZET,	of Virginia.
W. M. C. FAIRFAX,	of Virginia.
C. B. FISK,	of Maryland.
EDWARD F. GAY,	of Pennsylvania.
WALTER GWYNN,	of N. Carolina.
J. B. JERVIS,	of New York.
JONATHAN KNIGHT,	of Maryland.
BENJAMIN H. LATROBE,	of Maryland.
W. G. M'NEILL,	of S. Carolina.
EDWARD MILLER,	of Pennsylvania.
MONCURE ROBINSON,	of Virginia.
J. EDGAR THOMSON,	of Georgia.
ISAAC TRIMBLE,	of Maryland.
SYLVESTER WELCH,	of Kentucky.
G. W. WHISTLER,	of Connecticut.

In pursuance of the above proceedings, the committee met at the Hall of the Franklin Institute in the city of Philadelphia, on the 10th of April, 1839, and was organized by calling BENJAMIN WRIGHT to the Chair, and appointing EDWARD MILLER, Secretary.

After much interesting discussion and deliberation, two-thirds of those present approved of a form of Constitution, and signed the following paper.

HALL OF THE FRANKLIN INSTITUTE,
Philadelphia, April 12th, 1839.

The undersigned, members of the Committee of Seventeen appointed at the Convention of Civil Engineers, which met in Baltimore on the 11th of February last, assembled at the appointed time and place, and duly deliberated upon the subject of a Constitution for the proposed Society.

They recommend to the remaining members of the committee who were not able to attend the meeting, the adoption of the form which accompanies this circular, and respectfully request them, as soon as practicable, to notify the Secretary of the meeting of their approval or disapproval of the same.

BENJAMIN WRIGHT, of New York.
WILLIAM S. CAMPBELL, of Florida.
CHARLES B. FISK, of Maryland.
EDW. MILLER, of Pennsylvania.

It is believed that the provisions of the Constitution proposed, meet the views of Mr. Moncure Robinson, who was consulted in regard to them, although circumstances prevented him from being present at the meetings of the committee.

Letters from Sylvester Welch of Kentucky, B. H. Latrobe of Maryland, and John B. Jervis of New York, were then read, approving of the objects of the committee, and regretting the circumstances which prevented their attendance.

Resolutions of thanks to the Managers of the Franklin Institute, and to the President and Secretary of the Committee were adopted, after which the meeting adjourned sine die.

BENJAMIN WRIGHT, *Chairman.*

EDW. MILLER, *Secretary.*

CONSTITUTION.

SECTION I.

1. This Association shall be entitled "THE AMERICAN SOCIETY OF CIVIL ENGINEERS."

2. It has been instituted for the collection and diffusion of professional knowledge, the advancement of mechanical philosophy, and the elevation of the character and standing of the Civil Engineers of the United States.

SECTION II.

1. The Society shall consist of three classes, viz. Members, Associates, and Honorary Members.

2. Members shall be persons who are or have been engaged in the practice of a Civil Engineer

3. Associates shall be Architects, eminent Machinists, and others, whose pursuits constitute branches of engineering, but who are not Engineers by profession.

4. Honorary Members shall be persons who are not engaged in the practice of a Civil Engineer in this country, but are men eminent for science. The number of this class shall be limited to twenty-five.

5. The officers of the Society shall be a President, Vice President, Corresponding Secretary, Recording Secretary, Treasurer, and a Council, consisting of seven members.

6. The President, Council, Recording Secretary, and Treasurer, shall be elected annually by the Society, and shall be re-eligible.

7. The Vice President and the Corresponding Secretary, shall be annually chosen by the Council from its own number.

8. All the officers of the Society, with the exception of the Recording Secretary and Treasurer, shall be chosen from the class of members only. These officers need not belong to any of the classes. The duties of the Recording Secretary and Treasurer may be united in the same person, if the Society think proper.

9. If the elections should not occur at the time specified by the Constitution, the officers of the preceding year shall be continued until an election takes place.

SECTION III.

1. All elections shall be determined by ballot.

2. In order to become a member or associate of the Society, it is necessary to be proposed by three members, agreeably to a form given in the by-laws, wherein must be inserted the christian name, surname, and usual residence of the person proposed. His qualifications shall also be distinctly specified in such a manner, as to enable the members and associates generally to judge of his eligibility. The three members proposing him, shall also certify their personal knowledge of the candidate.

3. Every person proposed as an honorary member must be recommended by at least five members, who shall certify that he is a person eminent for science.

4. Every recommendation of a candidate must be delivered to the Recording Secretary at least four months before the session, and it shall then be the duty of the Recording Secretary immediately to inform each member of the Council, by letter, of all the nominations which have been made, in order that due inquiry may be instituted, whether the individuals proposed are suitable persons to be ballotted for, and also for which class of membership they should be presented to the Society.

5. When the Council approves the recommendation of any candidate, the proposition shall be signed by the chairman of the Council, and it shall then be read at the first meeting of the annual session.

6. The ballot shall take place on the next day but one after that on which the candidate is proposed, and the proportion of votes requisite for the election of any person into either class, shall be at least three-fourths of the persons present having a right to vote. Five black balls given in person, or in virtue of a written proxy, specifying the particular case under consideration, shall at all times be sufficient to prevent a person from being elected to any class of membership.

7. At the request of two members present, a ballot shall be postponed until the following session, but not longer.

8. In case of the non-election of any person ballotted for, no notice thereof shall be taken in the minutes.

9. At the election of members, none but members shall be permitted to vote. At the elections of associates and honorary members, both members and associates may vote.

10. A second ballot shall be granted at the same meeting, if immediately requested by three of the members present.

11. Whenever any person is elected a member or associate, the Recording Secretary shall immediately inform him of the same by letter, according to the form given in the by-laws. The election of honorary members shall be communicated to them as soon as possible, by a letter from the Corresponding Secretary, suitable to each particular case; and no person shall be considered as an honorary member, unless he signifies within twelve months his acquiescence in the election, after which he shall have all the rights and privileges of a member not forbidden by this Constitution.

12. Every person elected a member or associate, shall pay his admission fee and first annual contribution within three months of the day of his election, otherwise his election will be void.

13. Every member and associate elected, shall be required to sign this

Constitution, at the first meeting of the Society which he shall attend, subsequently to paying his admittance fee and first annual contribution. He shall then be introduced to the Society by the President or chairman of the meeting; and from that time shall be entitled to all the privileges of membership appertaining to the class to which he has been chosen.

14. If at any time there shall appear cause for the expulsion of any member, associate, or honorary member, a proposition to that effect signed by two members, shall be handed to the Council, who may lay it before the Society if they think proper, at any time during the session, with a report on the subject. At the next meeting but one after that on which the report of the Council has been read, the question with regard to the expulsion shall come before the Society; and if one-half of the members present agree that such member or associate be expelled, the President, or other officer or member in the chair, shall announce the fact accordingly, and the Recording Secretary shall forthwith communicate the same to such member or associate, according to the form given in the by-laws.

SECTION IV.

1. The President, Council, Recording Secretary and Treasurer, shall be elected on the second Wednesday in September, and a majority of the members present shall be necessary to elect any officer.

2. All persons to be eligible as officers of the Society, must be nominated on the preceding day, i. e. on the first day of the session.

SECTION V.

1. The contribution of each member shall be twenty dollars per annum; of each associate, fifteen dollars per annum. The first contribution shall be payable at the time of election, and every future payment shall become due in advance, on the first day of September.

2. New members and associates shall pay the sum of twenty dollars as an admission fee.

3. Every member and associate, is required to produce to the Society, at least one unpublished communication in each year, or present a scientific book, map, plan or model, not already in the possession of the Society, under a penalty of ten dollars.

4. Every member and associate shall be considered as belonging to the Society, and as such, liable to the payment of his annual contribution, until he has either forfeited his claim, or has signified to the Recording Secretary in writing, his desire to resign, when his name shall be erased from the list of members, provided his dues have been fully paid up.

5. Whenever any member or associate shall be two years in arrear in the payment of his annual contribution, the Recording Secretary shall send to such member or associate a letter of the form specified in the by-laws. And if the arrears shall not be paid within six months after the forwarding of said letter, the name of the member or associate so offending shall be publicly suspended in the hall of the Society, together with the amount of contribution due by him; and such member or associate shall not enjoy any of the privileges and advantages of his membership until his arrears be fully paid.

SECTION VI.

1. The President shall take the chair at all meetings of the Society, at which he shall be present, and shall regulate and keep order in the proceedings. He shall likewise state and put questions according to the sense and intention of the meeting, and carry into effect the regulations of the Society.

SECTION VII.

1. In the absence of the President, it shall be the duty of the Vice-President to preside at the meetings; but in case of the absence of both President and Vice President, the members present may elect any one of their number to take the chair at that meeting.

SECTION VIII.

1. The direction and management of the affairs of the Society shall be confided to a Council

2. The Council shall meet at the hall of the Society, at 7 o'clock P. M. on the first Tuesday in September, and hold adjourned meetings at such times as they please throughout the session. At any meeting of the Council, three members thereof shall constitute a quorum. All questions shall be decided in Council by vote; but at the desire of any two members present, the determination of any subject shall be postponed to the succeeding meeting.

3. It shall be the duty of the Council to draw up an annual account of the state of the funds of the Society, and of the receipts and expenditures of the past year, which, together with a report on the state of the institution, in which shall be given an abstract of all the proceedings, shall be read at the first meeting of the annual session.

4. The Council shall have the power when a majority of their number consider the enactment of any new by-law or the alteration or repeal of an existing one necessary, to propose the same to the Society, and if, after three days' notice given, a majority of the members present approve of the proposition, it shall be considered confirmed.

5. No by-law shall be made, altered or repealed, except in the manner above designated.

6. It shall be the duty of the Council to appoint special committees to investigate subjects of professional interest, and report at or before the next session of the Society. They may also request a member or associate to furnish to the Society a description or drawings of any important work executed by him.

7. When the Society determine to publish their Transactions, it shall be the duty of the Council to select from the materials in the possession of the Society, such as they deem most suitable for the purpose, to arrange and edit them, and superintend the progress of publication.

SECTION IX.

1. The Corresponding Secretary shall hold such correspondence as Council may deem necessary, (either with members of the Society or others,) in order to elicit facts and advance the objects and interests of the Society.

SECTION X.

1. The duties of the Recording Secretary shall be to attend the meetings of the Society and Council, to take minutes of all their proceedings, and enter them in their proper books; to read the minutes of the preceding meeting; to announce any donations made to the Society; to give notice of any candidate proposed for admission or to be balloted for; to read the letters and papers presented to the Society, in the order of time in which they were received, unless the Council shall otherwise determine; to keep the accounts of the Society; to take care of their books, papers, plans and all other property; to collect all moneys due to the Society, and deposit them in bank, to the credit of the Treasurer; to pay all dues of the Society; and to lay all accounts of the sums so paid and received before the Council.

2. During the sessions of the Society, the Recording Secretary shall have assistance in the performance of his duties, if the Council shall deem it necessary.

SECTION XI.

1. The Treasurer shall be a resident of the City of Philadelphia. All moneys belonging to the institution shall be deposited in his hands. No sum of money shall be paid by him except in pursuance of an order from the Recording Secretary, and if amounting to twenty dollars and upwards, the draft must be endorsed by two members of the Council.

2. All surplus funds in the hands of the Treasurer, shall be under the direction of Council, annually invested as an increasing fund for the use and advantage of the institution.

3. The Treasurer shall furnish a correct statement of all his accounts to the Council, at their first annual meeting.

SECTION XII.

1. The Society shall hold one session in each year in the City of Philadelphia. Twelve members shall constitute a quorum at any meeting. Until the Society obtains a hall of its own, the Council shall designate previously to each session the place where the meetings shall be held.

2. The annual session shall commence on the second Tuesday in September, at seven o'clock, P. M., and be adjourned, from time to time, until the business before the society is completed.*

3. The first business of the session shall be to receive and deliberate upon the Report of Council on the state of the Society, to nominate and elect officers for the ensuing year, and to ballot for the candidates approved by the council.

SECTION XIII.

1. No alteration of this Constitution shall be made except at a special general meeting, at which only the class of members shall be present. At any time during the session of the Society, a meeting shall be called for such purpose by the Council, upon the written requisition of ten members or associates, specifying the nature of the proposed alteration. Three days' notice of such meeting shall be given. No other business shall be transacted at such special meeting than that for which it was called, and two-thirds of the votes of all the members of the Society, given affirmatively either in person or by proxy, shall be necessary, in order to alter, amend, add to or diminish, any part of this Constitution.

SECTION XIV.

1. The whole of the property and effects of the Society, of what kind soever, shall be vested in the Council for the time being, to be held in trust for its use.

2. Every paper, map, plan or drawing which may be presented to the Society, shall be considered the property thereof, unless there shall have been a previous arrangement to the contrary.

3. No person shall publish any communication belonging to the Society, without the previous consent of the Council, given in accordance with such regulations as the Society may from time to time adopt.

4. No books, papers, plans, maps, models, or other property of a similar character, belonging to the Society, shall be taken from the hall; but every member, honorary member, and associate, shall have a right at all seasonable hours to inspect the same, and to make extracts and copies therefrom at his own expense, for his own use.

5. Every member, associate, and honorary member shall have the privilege of introducing visitors to be present at the public business of the

Society, and of taking them into the hall while the Society is not in session, on writing their names and his own in a book to be provided for that purpose: and these persons shall be permitted to read and examine the papers, books, plans, &c. of the Society, in the presence of the Recording Secretary, but they can on no pretence be permitted to make copies of the same.

SECTION XV.

1. The Secretary of the preliminary meeting, at which this Constitution was drawn up, shall remain the Secretary of the Society until the first meeting fixed by the Constitution, or until an election of officers takes place; and it shall be his duty to have this document, and the proceedings of the meeting at which it was prepared, printed, and sent as soon as possible to all the members of the committee of seventeen appointed at the Baltimore Convention, accompanied by letters, requesting an early acknowledgement, and an approval or disapproval of the same. If a majority of the committee approve, it shall be considered adopted.

SECTION XVI.

1. The Society of Civil Engineers which is to meet under this Constitution, in the City of Philadelphia, on the second Tuesday in September, 1839, shall be composed of such of the following forty gentlemen, as on or before the 1st day of September, signify their acceptance, and pay to the Secretary their admittance fee and first annual contribution. As soon as possible, after it shall be ascertained that a majority of the committee of seventeen have adopted the Constitution, it shall be the duty of the Secretary to notify all the members of the fact, and to urge their attendance at the September session.

Original Committee of Seventeen.

Benjamin Wright,
William S. Campbell.
Claude Crozet,
W. M. C. Fairfax,
Charles B. Fisk,
Edw. F. Gay,
Walter Gwynn,
John B. Jervis,
Jonathan Knight,

B. H. Latrobe;
W. G. M'Neill,
Edward Miller,
Moncure Robinson,
J. Edgar Thomson,
Isaac Trimble,
Sylvester Welch,
G. W. Whistler.

Members added.

Horatio Allen,
Benjamin Ayerigg,
William Cooke,
A. A. Dexter,
E. A. Douglass,
Charles Ellet, Jun.
John M. Fess,
C. F. Mt Garnett,
D. Griffin,
John H. Hopkins,
James Hunter,
S. H. Kneass,

S H. Long,
S. W. Mifflin,
S. W. Roberts,
Wirt Robinson,
C. B. Shaw,
Antes Snyder,
M. R. Stealey,
A. Talcott,
Ashbel Welch,
W. Hassel Wilson,
W. C. Young.

Third Annual Report of the Western Rail-road Corporation.

To the Honorable the Senate and House of Representatives of the Commonwealth of Massachusetts:

In presenting to the Legislature their *third* Annual Report, the Directors of the Western Rail-road Corporation deem it due to the Commonwealth, as a principal stockholder, and a guarantor of the credit of the corporation, to exhibit a *detailed* account of their operations during the past year,—of the present condition of the work which they have in charge,—and the prospects of its future advancement.

At the date of the last Report, the whole line of the road, eastward of Connecticut river, a distance of 54 miles, had, (with the exception of about two miles adjoining the river,) been put under contract for grading; the graduation of 27 miles of the lighter part of it had been completed; and the work was in progress upon the remaining 25 miles.

An opinion was then expressed, that, should no unfortunate obstacle interpose to delay, the whole of this part of the line would be graded and ready for the superstructure, by the spring of 1839.

Soon after that time, the two miles adjoining the river were put under contract, and the work of graduation upon all the unfinished sections, has since been vigorously prosecuted. At the present time there are about 52 miles fully graded; and, excepting at four points upon the line, the grading is already nearly finished. The excepted points are, at New-Worcester—at the summit in Charlton—at Twelve Mile Brook, in Wilbraham, and on the sections near Connecticut river. At all these places, excepting at the Charlton summit, for six or eight months prior to the grant by the last Legislature, the work was much retarded by the uncertainty which existed, whether funds would be provided for the prosecution of the enterprise. They are now, however, so much advanced as to justify the belief, that they will be ready for the rails in the month of May next. The lighter intermediate sections, upon portions of which the grading is yet unfinished, may easily be completed during the winter.

Of the masonry, little remains to be done, excepting the construction of a few road bridges, and these will be forwarded at an early day.

The rail-road bridges upon this part of the line were contracted for in May last. About half of them are constructed, and the materials for the residue are delivered, and they are now in preparation.

The tables and schedules annexed hereto will exhibit, more in detail, the quantity of work which has been done east of the river, up to the 30th of November, 1838, and that which then remained to be done. These embrace the quantity of earth, loose rock and solid rock excavated and remaining to be excavated; the masonry and bridging executed and remaining to be done; the number of rail-road bridges, road bridges and culverts; and schedules of the grades, curves, and of some of the larger cuttings and embankments; with a specification of the distances, by the road, between some prominent known points.

The attention of the Board has been seasonably directed to providing materials for the *superstructure* of the road east of the river. They have adopted the *edge rail* of the T pattern, weighing about 56½ pounds to the yard. This is laid upon transverse sleepers of 7 inches, placed three feet apart from centre to centre; and these have their bearings, under the rail, upon longitudinal sills 8 inches by 3, which are wholly imbedded on a road-way of gravel or sand.

The timber for the superstructure has all been contracted for, and that for about 38 miles is already delivered. The residue will be received in season for early operations in the coming spring.

The *Iron* for about 17 miles of the road was purchased early the past year,—it has arrived and is principally delivered on the line; and that for the residue is contracted for, with orders for its shipment in season for the spring and summer operations.

In the mean time, about six miles of the track have been laid, ready for use, commencing $2\frac{1}{2}$ miles from Connecticut river and extending eastward. The laying of the residue of the rails will be commenced in the spring, and completed at the earliest practicable period.

The *Engines* and *Cars* necessary to put this part of the road in full operation, are under contract,—the former to be built at Lowell, and the latter at Worcester and Springfield; and it is believed they will be fully equal to any now in use in the country.

Suitable and convenient *Depot Lands* for the Stations have been secured at Worcester, Charlton, South Brookfield, West Brookfield, Warren, Palmer, Wilbraham and Springfield, and negotiations are in progress for lands for the same purpose, in the village of Clappville. These are all the points at which the Directors have, as yet, decided to locate the stations—thus providing for the trains to stop seven times between Worcester and Connecticut river, a distance of 54 miles. These lands have all been procured at the inconsiderable expense of \$4200.

The *Damages* for *Land* and *Fencing*, for the road way, have all been settled, with the exception of less than one mile at different intervals.

And the few remaining claims are liquidated by agreement, or by adjudications of the county commissioners. The average cost, exclusive of half a mile in Worcester village, was formerly estimated at \$1240; and it proves to be about \$1250 per mile, including all incidental expenses of commissioners, referees and one jury. The number of separate claims thus adjusted, is about 350.

The directors have not been unmindful of the importance of persevering effort to open this part of the road for use at an early day. They have for some months directed the particular attention of the executive officers of the corporation to this object; and it is believed, no exertion has been wanting to accomplish it.

Although a great part of the road has been graded, and contracts have been made for the materials for the superstructure, and for the engines and cars, yet the undersigned beg leave to remind the friends of the enterprise, that much remains to be done, before the road can be efficiently opened for public use. In addition to the remaining part of the grading, masonry and bridging—the delivery, preparation, transportation, and proper distribution of the iron, plates, spikes, sills and sleepers for the superstructure—the laying down of 48 miles of track with the necessary turnouts—the preparation of the Depot grounds—the erection of the buildings at nine stations—the delivery and trial of the engines and cars—the means for the supply of water at the several stations—the erection of signs at the road-crossings—the purchase of fuel for all the stations—and the employment and organization of the various subordinate officers required for the moving power, and for superintending the business of the road—will demand much time and labor on the part of all the officers of the corporation. It must also be borne in mind, that, although the various contracts are believed to be made with the most responsible men, yet the punctual fulfilment of their engagements is not

within the control of the corporation; and a failure to perform any of them, may cause serious embarrassment, and a delay of the work. It will be recollected, also, that while these various branches of labor are in progress, much of the attention of the officers must be directed to the whole line of 62.6 miles westward of the river.

In view of these considerations, the undersigned think it would be hazardous to name, now, with certainty, any particular date at which the road east of Connecticut river will be in successful operation. It will be done at the earliest period, consistent with the great object in view. And if no unforeseen obstacle interposes, they flatter themselves, that that event will not be postponed beyond the month of September next.

At the time of presenting our last Report, the field-work for the location of the road *westward of Connecticut river*, had just been completed, and the maps and estimates were in progress. The line of definite location passed through the towns of Westfield, Chester,—through the Pontoosuc valley, to the summit in Washington, and thence through Hinsdale, Dalton, Pittsfield and Richmond, to the State boundary. The order of the Board directing this location, had reserved, however, three points for subsequent decision, viz. the direction of the lines through the villages of Westfield and Pittsfield, and the western termination of the road—either at the Canaan Gap, in West Stockbridge, or at Hatch's Gap, in Richmond. It was then uncertain at which of these terminations, the friends of the Albany road would prefer to connect with our line. At the presentation of the Report upon our final location, it was, however, ascertained, as far as was then practicable, that their preferences were for the union at the Canaan Gap; and the Board established their location directly to that point; leaving the village of West Stockbridge about one mile south of the line. At the same time, the route passing a little north of the Common in Pittsfield, was also established. Farther information was required respecting the lines through Westfield, and a definite decision will, probably, now be made upon them in a few weeks.

The act of the last Legislature, in aid of the Corporation, required them, during the year 1838, to "commence the construction of such part of the road, lying between Springfield and Pittsfield, as would require the longest time for its completion; and to prosecute the same in such a manner, as to secure the completion of the whole road from Springfield to the western line of the State, as early as was practicable, with a due regard to economy." This provision accorded with the judgment and wishes of the Directors; and in pursuance of it, they, in March last, ordered about 34½ miles of the western part of the road to be put under contract, extending from near Henry's tavern in Chester, to the State line, and including the heaviest part of the work, with a *proviso*, that upon about 11½ miles of it, between the village of Pittsfield and the summit in Washington, the work should not commence until it should be necessary, in order to ensure its completion by the more difficult sections should be graded. Under this order, the grading upon the remaining 23 miles was commenced in June last, and it has been prosecuted with as much efficiency as was practicable, to the present time. About five miles of it are already graded.

The stockholders in the western part of the State were early encouraged, and the part of the road west of Pittsfield, would be put in operation as soon as the part of the line eastward of Connecticut river. And the Board have always been strongly desirous to fulfil this expectation. The limited means of the treasury, however, during the latter part of the year 1837, and the winter of 1838, rendered it impossible for them to com-

mence that work, without incurring obligations, which they had no means of meeting. But as soon as was practicable, after funds were provided by the liberality of the last Legislature, that division was let to efficient and responsible contractors, with express obligations in the contracts, to complete the grading by the 1st of July, 1839. And they have ever since been required to keep upon the heavier sections of it, as large a force as they could employ, without greatly disproportioned expense. And the Directors have, heretofore still indulged the hope, that the whole might be completed by the desired time. As the work has advanced, however, the character of the cuttings upon some of the heavier sections, has proved much more difficult than had been anticipated. And the Resident Engineer is now of opinion, that there are two of those sections which it will be impossible to finish, within the time specified in the contracts. But no exertions will be spared to expedite this work, and to place the superstructure upon it, as soon as is practicable.

The work upon the $11\frac{1}{2}$ miles between Pittsfield and the Washington summit will probably be commenced in the coming spring.

The Division from the summit to near Henry's, in Chester, a distance of about $11\frac{1}{2}$ miles through the Pontoosuc valley, embraces much very heavy rock excavation, and extensive embankments, with a large quantity of expensive and heavy masonry. The two summit sections have a long rock-cutting, a part of which is 58 feet deep, and two large embankments of 49 and 37 feet in height. The contractors for grading these, stipulate to finish them by the 1st of July, 1840; but in one contingency, they are to be allowed till the close of that year to perform the work. They are now proceeding with it very satisfactorily. But in the present state of the work no definite opinion can be formed, as to the time when it will be completed. The other sections of this Division may be graded somewhat within the time allowed for those at the summit.

The character of the country between Henry's and Connecticut river, being 28 miles, is such, as to need much less time for its grading than the summit Division, though there are points in the former which may require some 15 months. The Directors, therefore judged it impolitic to commence upon it during the past year. But it is now their wish to put it under contract soon, and to begin the work in the spring of 1839.

The time of commencing this work, and the mode of conducting it afterwards, may depend somewhat upon the question, whether an attempt should be made to open it for use, before, and independently of, the heavier summit Division. This question, again, depends upon the time when the summit sections will probably be graded. And it is supposed that *this* point cannot reasonably be ascertained before late in the next season, when the character of the rock cutting there, may be more clearly developed. If this should then forbid the hope of grading the summit sections before the close of 1840, the Directors would, probably, desire to have the 28 miles east of Henry's, then so far advanced, as to enable them to finish the grading of them in the Summer of 1840, and to open that part of the line for use in the course of that year.

If, on the contrary, it should, during the next season, appear, that the summit Division might all be prepared for the superstructure, by July, 1840, it would then be about as much advanced, as the work east of it could well be, and the whole might probably be opened for use at the same time.

In thus setting forth the condition and future prospects of this Road, it may not be improper to state briefly, the condition of the enterprises of a similar character, with which it is proposed hereafter to connect it.

At its western termination, the Hudson and Berkshire Road has been completed and opened for use, within the last year, under prospects of business flattering to the friends of it. And that road has been extended to the village of West Stockbridge, a distance of $2\frac{3}{4}$ miles within this State.

Within the last month, a very large meeting of the friends of the Albany and West Stockbridge Rail-road has been holden at Albany, and energetic measures have been adopted to secure the prosecution of that work during the year 1839.

A Rail-road is also now in grading, which is to extend from the Sound at Bridgeport, in Connecticut, through the Housatonic valley to West Stockbridge.

One half the New Haven and Hartford road is now in use, and the grading upon all the residue of it is advancing rapidly. Surveys are also now in progress for a rail-road from Hartford to Springfield, with a view to unite that with the Western road.

And the friends of the Worcester and Norwich road give strong assurances, that it will be in full operation before the close of 1839.

Soon after the passage [of the act of February 21, 1838, authorizing the issuing of the scrip of the State, for two millions, one hundred thousand dollars, to aid the construction of the road, the Corporation, at an adjournment of their last annual meeting, assented to the provisions thereof, and they subsequently gave to the Commonwealth the security required thereby. And they have since that time made the collections upon the assessments due from the private Stockholders, which were prescribed by that act, to entitle them to receive *the whole of the scrip* thus authorized to be issued.

At the annual meeting of the Corporation in February last, all the Stockholders, Directors of the previous year, were re-elected.

OF THE FINANCES.

Within the last month, a full report has been made to the Board, upon the subject of the *Finances*, embracing the estimated cost of the whole work,—and the whole means provided therefor,—an account of past expenditures and present resources—and the amount necessary for the future. The following is an abstract of that document.

ESTIMATED COST OF THE ROAD.

First. East of Connecticut river.

For graduation, masonry, bridging, superstructure, engines, cars, depot buildings, and Engineer Department,	\$1,739,163 30
Miscellaneous expenses, including salaries, printing, stationary, rent of offices, expenses of Directors and Committees and all incidental expenses from Jan. 1836, to Dec. 1839, including \$8,000 for surveys in 1835,	\$34,652 72
Depot Lands,	4,000 00
Land damages and fencing 54 miles,	86,913 10
Total cost east of the river,	\$1,864,729 12

Second. West of Connecticut River.

For graduation, masonry, bridging, superstructure, engines, cars, depot buildings, and Engineer Department, (the latter to December, 1840,)	\$2,213,493 47
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Miscellaneous expenses to April 1, 1841, (including as before,)	28,497 12	
Land damages, fencing and Depot lands,	84,452 02	
Total cost west of the river, 62.6 miles,		2,326,442 61
Total cost of the Road—110.6 miles,		\$4,191,171 73

RESOURCES OF THE CORPORATION.

Six assessments, being \$30, on 30,000 shares and interest available thereon, deducting probable losses,	\$910,643 30	
Proceeds of State scrip of 1838,	2,100,000 00	
Total resources,		3,910,643 30
Balance, to be provided for,		\$1,180,528 43

PAST EXPENDITURES, AND RESOURCES FOR THE FUTURE.

On Dec. 1, 1838, there had been expended and paid Which left of available resources applicable to pay- ments after that date,	1,259,619 11	
Amount estimated necessary to complete the road east of the river and put it in full operation,	1,751,024 19	
		755,027 66
Balance amount applicable west of the river after Dec. 1, 1838,		\$995,996 53

If the residue of the road *west of the river*, should be put under contract, and the work on the whole, be commenced by the first of March next, and be prosecuted in the same manner, as that *east* of the river has been heretofore conducted, viz., by pushing the heavier sections, as far as is consistent with a prudent economy, and the lighter ones only in such manner, as that the whole may be completed together, it is estimated that there will be required west of the river, by March 1, 1840, for graduation, masonry, bridging and engineer department for the *whole line*, and for superstructure and buildings for stations, *between Pittsfield and the state line*, the sum of

Leaving on hand, March 1, 1840,	778,770 64
If the whole, including the lighter work, is advanced to completion as early as is practicable, consistently with economy, there will be required by March 1, 1840, an expenditure of	217,225 89
Leaving on hand at that date	898,770 64
	97,225 89

Both of these latter estimates are based upon the supposition that the contracts to be now made for grading the 28 miles, must be made, on condition that the Corporation shall have a right to suspend the work in the winter of 1840, if farther funds are not provided for completing the same. And it is supposed, that as favorable terms cannot be had for such contracts, as would be obtained, if no such contingency were to be provided for.

And it may not be amiss to add, also, that the contracts already made for grading the summit Division, being made when adequate funds were secured for their completion, may, if those funds are divested in part to the grading of the 28 miles, be suspended also in the winter of 1840, if additional funds are not then provided.

It should be borne in mind also, that, as before stated, the 28 miles east of Henry's, can probably be graded ready for the superstructure, by July 1, 1840. And to provide against serious delay in opening that part of the road, the iron and other materials for the superstructure, and the engines and cars should be contracted for prior to 1st of July, 1840. These upon the estimate heretofore made, will cost about

\$300,000

And if it should be found that the summit Division can also be ready for the rails by July, 1840, provision should be made for the superstructure, and the engines and cars for the 23 miles between Henry's and Pittsfield before January 1, 1840—which will require about more.

250,000

Under the act of February last, the Treasurer has received the scrip of the State amounting to the sum of

900,000 00

Of this, there had been sold in England, at the date of the last advices, the amount of

524,444 44

at an advance above the par value of from $2\frac{1}{2}$ to 4 per cent.

And the Treasurer of the Corporation has paid over to the Treasurer of the Commonwealth, the sum of

65,550 35

on account of monies received by him, from the premium on sales of scrip, and the proceeds of Exchange; to be, by the Treasurer of the Commonwealth, placed at interest, as a part of the *Sinking Fund*, created by said act for the final redemption of the scrip.

The whole scrip thus far issued, is made payable—both principal and interest—at the House of Baring, Brothers & Co., in London, who are constituted the agents of the Corporation therefor.

The Receipts and Expenditures of the Corporation for the year past, as stated by the Treasurer, are as follows, viz:

RECEIPTS.

Balance on hand, as per last Report, January 3, 1838,	\$69,889 67
Amount since received on 3d Instalment,	11,875 00
“ “ 4th “	68,870 00
Amount since received on 5th Instalment,	112,270 00
“ “ 6th “	138,950 00
	<hr/>
“ for sale of State scrip	524,444 44
“ Exchange drawn against State scrip,	202,226 02
	<hr/>
“ on account of Contingent Fund,	726,670 46
	6,115 00
	<hr/>
	\$1,134,640 13

EXPENDITURES.

Amount paid for incidental expenses,	12,420 41
“ for Engineer department,	31,184 57
“ for Land damages,	67,322 11
“ Timber lands,	4,642 73
“ Construction including Iron,	659,024 16
“ Depot lands,	2,286 00
“ Balance of Interest on loan,	3,704 59
Balance,	*354,055 56
	<hr/>
	1,134,640 13

*The balance consists of the following items:

Balance of cash account,	262,346 07	
" in hands of Wm. H. Swift,		
Resident Engineer,	6,788 84	
" in hands of George Bliss, Agent,	1,415 92	
Cash loaned on collateral,	81,000 00	
Notes receivable,	80,158 11	
		431,708 94
Less Exchange account or sinking fund,	76,868 05	
" bal. due Baring, Brothers & Co. Liverpool,	785 33	
		77,653 38
		<u>\$354,055 56</u>

The following is a statement of the whole collection upon the six assessments laid on the Stock, up to Dec. 31st, 1838.

No. of Assessment.	Time when Payable.	Amount of each Assessment.	Amount collected.	Amount now due.
First, .	Feb. 1, 1836,	150,000	150,000	
Second, .	April 15, 1836,	150,000	150,000	
Third, .	Jan. 16, 1837,	150,000	145,860	4,140
Fourth, .	Sept. 25, 1837,	150,000	143,970	6,030
Fifth, .	Nov. 15, 1837,	150,000	141,100	8,900
Sixth, .	June 11, 1838,	150,000	139,670	10,330
Totals,	900,000	870,600	29,400

The undersigned from their first connexion with this enterprise as Directors, have felt that onerous duties and a heavy responsibility were developed upon them, in the care of so extended a work. In the discharge of these duties they have ever been solicitous to watch, vigilantly, the expenditure of the funds of the Corporation. The active operations, which spread along a line of over 116 miles, necessarily require the employment of a considerable number of executive officers, directly or indirectly responsible to the Board. Through the agency of these officers the work is constructed, and all the disbursements are made. And the Board have felt it to be incumbent upon them, from time to time, to examine their proceedings, scrutinize their accounts, ascertain the manner which their several duties were discharged, and personally to inspect their operations, both in the offices and in the field.

In furtherance of these objects, the Directors, in April last, appointed Messrs. Hudson and Walker, two of their number, "a committee with instructions to make a personal examination and inspection of the several lines located westward of the river, and of the work upon the line of the

road, between Worcester and Springfield; to examine the mode of making contracts, and the terms of them, and the manner of their fulfilment; to inquire into the nature and extent of the duties devolving upon the agent and his assistant, and upon the engineers and their assistants, and the manner in which those duties are performed—including an examination of the mode of doing business, and keeping accounts in the offices of the agent and engineers; to inquire into the titles procured for the track of the road, and the mode in which they are secured, and the propriety of the prices paid therefor; and, *in general*, to make a thorough inspection of all the business and affairs of the corporation, connected with the location and construction of the road."

After spending several days upon the line and in the offices, in the discharge of the various duties assigned to them, the Committee made a detailed report to the Directors, which was accepted by them. A copy of that report is hereto annexed, for the inspection of those who may desire to know the extent of the examination, and the results at which the Committee arrived.

The Directors have now made to the Legislature a full exposition of all the concerns of the corporation. The work which they have in charge is one of great interest and importance; and they were therefore desirous that information respecting it should be spread freely before the community. It is a *public work*—a work for posterity—one in the success of which the Commonwealth, and all its citizens, have a deep and permanent interest. And it was therefore due to the people, that its condition, its progress, its future prospects and wants, and all its varied relations, should be frankly exhibited to the *representatives* of the people. Without their *further aid*, the work cannot be completed. To their care and protection the undersigned commend it. If the enterprise has merits, they have no doubt that these will be duly appreciated. If it has wants, they have entire confidence that they will be provided for.

THOS. B. WALES,
EDMUND DWIGHT,
JOHN HENSHAW,
JOSIAH QUINCY, Jr.
ROBERT RANTOUL, Jr.
AMASA WALKER,
CHARLES HUDSON,
GEORGE BLISS,
Directors.

Boston, January 1, 1839.

Statement, exhibiting the amount of Earth, Loose Rock, and Solid Rock excavated, the number of perches of Masonry (of 25 cubic feet) laid, and the number of feet of Bridging completed, between Worcester and Connecticut River, on the 30th of November, 1838.

No. of Division.	Earth. Cubic Yards.	Loose Rock. Cubic Yards.	Solid Rock Cubic Yards.	Masonry. Perches.	Bridging. Feet.
1	772,196	4,321	69,012	15,894	270
2	545,500	1,019	16,025	9,398	120
3	252,176	3,638	1,710	8,633	312
4	857,555	7,645	14,504	10,128	
Totals,	2,427,427	16,623	101,251	44,053	702

NOTE.—On the 1st Division, and on part of the 2d, the contracts were made for earth and loose rock together. The quantity of loose rock cannot, therefore, be exhibited separately upon the sections which were contracted for in the above manner.

Statement exhibiting the amount of Earth, Loose Rock, and solid Rock, to be excavated, the number of perches of Masonry to be laid, and the number of feet of Bridging to be put up, between Worcester and Connecticut River, on 30th November, 1838.

No. of Division.	Earth. Cubic Yards.	Loose Rock Cubic Yards.	Solid Rock. Cubic Yards.	Masonry. Perches.	Bridging. Feet.
1	112,800	.	6567	1500	71
2	12,551	.	106	700	174
3	58,194	900	1000	600	600
4	126,307	.	.	500	135
Totals,	309,825	900	7673	3300	980

Schedule of Grades, East of Connecticut River.

No. of Planes.	Inclination per mile Feet.	Length of line on ea Grade—Miles	No. of Planes ascend ing—West.	No. of Planes descend ing—West.
5	Level.	2,071		
15	0 to 10 ft.	11,800		
11	10 to 20 ft.	8,317		
6	20 to 30 ft.	5,127		
8	30 to 40 ft.	11,375		
6	40 to 50 ft.	11,545		
1	51½ ft.	1,432		
1	60 ft.	2,500		
53		54,167	22	26

Schedule of Curves, East of Connecticut River.

No. of Curves.	Amount of Curvature—Degrees.	Length of Radius—Feet.
13	½ degree to 1 degree	11,459 to 5730
22	1 degree to 2 degrees	5730 to 2865
21	2 degrees to 3 degrees	2865 to 1910
4	3 degrees to 4 degrees	1910 to 1432
1	— 5 degrees	1146 —
61		

Whole length of straight line—about 35 miles.

*Schedule of Bridges, Culverts, and large Cuttings, and Embankments,
East of Connecticut River.*

There are 24 rail-road bridges, from 12 to 175 feet long,
11 road and farm bridges,
110 box and open culverts,
8 arch culverts, from 8 to 35 feet span, and from 32 to
191 feet long.

Of the larger Cuttings, there are
10 of from 24 to 30 feet deep,
9 " 30 to 35 "
3 " 35 to 40 "
1 each of 43, 47, 52 and 80 feet deep.

Of the larger Embankments, there are
9 of from 24 to 30 feet high,
7 " 30 to 35 "
2 of 38 "
1 each of 48, 60, 63 and 63 feet high.

Schedule of Distances by the line of the Railroad, from the Passenger Station House, on the east side of Grafton Street, Worcester, (which is 812 feet west of the junction of the Boston and Worcester Railroad,) to sundry places on the line.

From the Passenger Station House, Worcester, to	Town.	Distance Miles.	Differ- ence. Miles.	Distance between Stations. Miles.
The Oxford road,	S. Leicester,	8 74		8 74
Leicester & Charlton road (near Jones')	Charlton,	11 98	3 24	
Summit,	do.	12 96	0 98	
Road by Hall's Charlton station,	do.	13 24	0 28	4 50
Road near Nathaniel Bemis, .	Spencer,	17 50	4 26	
Five Mile River,	E. Brookfield,	19 78	2 28	
Brinfield road by Station land, .	S. Brookfield,	22 60	2 82	9 36
do. do. . . .	W. Brookfield,	25 32	2 72	2 72
Road by do. . . .	Warren,	28 22	2 90	2 90
Blair's saw mill,	do.	31 69	3 47	
Road by Alonzo V. Blanchard's, .	Palmer,	37 69	6 00	
Road by Paimer Station, (J. Shaw's),	do.	39 10	1 41	10 88
Do. near Glover's store, . . .	Monson,	42 43	3 33	
Do. by Station, (N. Stevens,) .	Wilbraham,	46 96	4 53	7 86
Crossing Chicopee Falls road, .	Springfield,	51 93	4 97	
Station land, Main street, . . .	do.	53 98	2 05	7 02
East Bank of Connecticut River,	do.	54 16	0 18	
Add from junction of Boston and Worcester road, to Station House Worcester,		0 15		
Whole length of line east of River,	.	54 31		

WESTERN RAIL-ROAD OFFICE,
Worcester, July 24, 1838. }

The Committee appointed by an order of the 12th of April last, "to examine the mode of making contracts, and the terms of them, and the manner of their fulfilment; to examine into the nature and extent of the duties devolving upon the agent and his assistant, and upon the engineers and their assistants, and the manner in which their duties are performed, including an examination of the mode of doing business and keeping accounts in the offices of the agent and engineers; to examine into the titles procured for the track of the road, and the mode in which they are secured, and the propriety of the prices paid therefor; and in general, to make a thorough inspection of all the business and affairs of the corporation connected with the location and construction of the road," ask leave to submit the following

REPORT:

The Committee in the discharge of their duty, passed over the road from Worcester to the line of the State at West Stockbridge, and viewed particularly all the principal points on the road; and found that the work was generally progressing as rapidly as is consistent with economy. The Committee turned their attention particularly to the duties devolving upon the agent and his assistant, and the engineer and his assistants. They called upon each of these officers, inspected their books, and inquired into the character and amount of the labors they had to perform; and the examination resulted in a full conviction, that the labors were sufficient to employ those officers every hour of their time. As these duties were more numerous and arduous than the Committee had anticipated, they will give a brief description of them; and if the information is not needed by others, it will at least show that the Committee were somewhat particular in their inquiries.

The resident engineer it is well known, has the general supervision of the location and construction of the road. As a great part of his duties are connected with those of his assistants, we will not enlarge upon them here; believing that a description of the assistants' labors, all of which pass under his inspection, will give some view of the amount of labor he has to perform.

The assistant engineers have each a division of the road of from eight to twenty miles in length. Their labors are various. As some of them have been upon the road from the first, we will begin with the trial surveys. After a general view of the country, a line is run, and the courses, distances, and altitudes are carefully noted. After these field labors are performed, a computation is made, and if the result does not come within the limits prescribed by the resident engineer, that line is abandoned, and another is sought. Much time and labor are necessarily spent in fixing upon the approximate location. This is required by the strictest economy. A few days or even weeks spent in avoiding a deep cut, a heavy embankment, a sharp curve, or a high grade, might save the corporation more than a year's salary of one of these officers. When the approximate location is agreed upon, the line is carefully run in stations of 100 feet, and the curves together with the rise and fall noted. In addition to this, cross sections are taken at every station, noting the rise and fall of the land on the right and left of the centre line, and if the surface of the ground changes as it frequently must between the stations, cross sections are taken at such intermediate points. The field labor being thus

accomplished, the assistant makes a plan and profile of the route, ascertains the grade, plats the cross sections, and estimates mathematically, the grade, deflection, and the amount of cutting and filling, the number of bridges, and the amount of masonry. In some cases of course, two or more lines present themselves, so nearly equal in their claims, that a preference cannot be given until all this process is gone through with, and the results compared. Other examinations must be made out of the line of the road. If earth is to be wasted, reference must be had to the place for its deposit; if earth is to be borrowed, a place must be selected from which to obtain it, swamps must be sounded and hills bored, and the nature of the soil and materials ascertained with as much accuracy as possible. After all these surveys and estimates are made, they are recorded by the assistant in a book kept for that purpose. The result of all these are submitted to the resident engineer; and during the progress of the surveys, his advice and personal attendance are frequently required.

When the location is fixed, and the road put under contract, the assistants have to go over their divisions ranging in length from ten to twenty miles, and mark the number of feet of cut or fill at each station, and also erect the slope stakes. The work is commenced and the centre stakes of course removed on that part of the line, and the slope stakes, by design or accident, are frequently pulled up. If left to themselves, the workmen would be likely to get out of the line, or below the grade. It is necessary therefore, that the assistant or some one under him, should be upon the ground almost daily. These stakes must be frequently replaced, and the centres run.

Another important item in the construction of the road, and the labor of the assistants, is the masonry. This requires almost constant inspection. The value of masonry must depend very much upon the character of the materials used; and in the absence of an inspector the contractor might use improper materials; and inspection here is more necessary during the progress of the work, as a fraud could not, in many cases, be detected after the work is completed.

The labors of the assistants in relation to the masonry is heightened by the fact, that the foundation for all bridges and principal culverts is not included in the contracts, but is laid by the day. This renders the presence of the assistant the more important, as he has not only to inspect the work, but to see that the hands labor industriously. Another important field of labor for the assistants is this: the contracts for grading are made for a specific sum for excavating every cubic yard of earth; another and greater sum for every yard of loose rock, and a still greater sum for every yard of solid rock. All rocks up to a certain size are, by the contract, deemed to be earth; from that size up to another given size, they are deemed to be loose rock, and all above that, solid rock. In some sections, where rocks abound, the presence of the assistant is required almost hourly, to examine the stone and decide to which particular class they belong; otherwise, the contractor might pass off for loose rock what ought to be considered earth, and for solid rock what should be deemed loose rock.

In the progress of the work, unforeseen obstacles frequently present themselves, rendering it expedient to change the grade or the location. This requires the time and the attention of the assistant. There is also a class of periodical labors which devolve upon these officers. The contractors are paid every month; this renders it necessary that the work

done on the whole division should be measured and estimated once in thirty days, and the amount painted upon the profile and transmitted to the office of the resident engineer. This throws a large amount of labor upon the assistants in the short space of a few days. Add to this, when the work is completed the whole is accurately measured and estimated, section by section, to furnish the basis for the final settlement with the contractors.

There is also a large amount of office labors to be performed. Accurate plans must be made to file with the County Commissioners; every land owner has a right by statute to demand a plan of his land before it is entered upon. This is furnished by the assistant. The agent requires a plan or an accurate description of the location by which to frame his deeds and settle the land damages. The working plans for the masonry form a considerable item. There is another branch of labor connected with the masonry. The contractors took the stone where they could get them easiest, without any reference to the cost to the Corporation for damages to land. This system entailed upon the assistants the labor of settling the damages for taking stone. This system is now generally abandoned, and it is made the duty of the assistant to select the stone and negotiate with the land owners for the damages. In some cases of land damages it is found expedient to buy the farm or lot crossed by the road; in such cases, the assistant has to survey the land and make out a plan for the agent. These labors, minute as some of them may appear, cannot well be dispensed with economically. In various respects, in ways almost innumerable, these officers can save the Corporation more than the amount of their pay. Take a section where there is, by estimate, an excess of excavation over the embankment of, say, 500 yards. The contractor might find it for his interest to waste this amount before he completed his embankment. But it may so happen that some part of the earth under the embankment may give way, and let the embankment settle, and this supposed excess may be needed to bring it up to grade. An engineer on the spot, seeing an indication in the earth under the embankment to give way, will immediately arrest the wasting of earth, and order it to be carried and placed upon the embankment which is settling. In this way the Corporation may be saved from the charge of land damages, by borrowing earth out of the line of the road and perhaps from land damages by wasting earth upon it; and also from the expense of paying for double excavation.

Of nearly the same character is another saving that may be made by the constant inspection of the assistant. Different kinds of earth shrink in different ratios by being removed. This shrinkage may vary the supposed balance of cut and fill so as to affect the borrowing or wasting. The assistant, by observing the nature of the soil, may give directions to the contractor, so as to have the excavation and embankment balance each other; and thus save the expense of wasting and borrowing. Whereas the contractor, whose interest is different from that of the Corporation, might answer his end better by borrowing in one place and wasting in another, though it might subject the Corporation to an extra charge.

These labors, or something like them, devolve upon each assistant or master of a division. The assistants have generally four persons under them, who aid them in the performance of their labors, and who receive from one to two dollars per day for their services, and find themselves. We have remarked before, what every one knows, that the Resident

Engineer has the general supervision of the whole road. All the business of the Assistant Engineer passes under his inspection, and all difficult parts of the road receive his personal examination. He is also liable to be called unexpectedly to distant parts of the line. When any thing of a difficult character presents itself, the Assistant immediately calls upon the Resident Engineer, who must immediately, either in person, or by letter, give the information needed. The Resident Engineer is also associated with the agent in putting the road under contract, and in obtaining the necessary materials for bridges, superstructure, &c. Perhaps we cannot better describe the labors of the Resident Engineer in this respect, than by giving a brief account of the manner in which the contracts for grading are made. The road is divided into sections, so as to have the excavations and embankments balance each other as nearly as practicable. They then advertise for proposals for each section. When the proposals have come in, they are all arranged and recorded by the Engineer. If the proposals are reasonable, they close with the lowest responsible bidder; if the proposals are not reasonably low in any case, that section is reserved for a future contract. When the proposals are closed with, a written agreement is entered into, and signed and delivered in the presence of witnesses, by which the Corporation, by their agent, agree to pay so much per cubic yard for excavating earth, so much for loose rock, so much for solid rock, and so much for masonry, &c. And the contractor agrees on his part to do the work in a given time, to the acceptance of the Engineer. One distinguishing feature in these instruments is, that the Engineer has almost unlimited power over the contract, and may change, modify or annul it, at his pleasure.

This throws great responsibility upon the Engineer, together with no small share of labor. All the money expended for the graduation and masonry is disbursed by the Engineer. The oversight of more than 100 miles of road, and the labors connected therewith, must necessarily employ the time of one individual. The manner in which the contractors are paid, is attended with some extra labor. We have before said, that the assistants measure and estimate the amount of work done on each section every month. These returns are made to the Engineer, and from these data the monthly pay is made out; but to ensure the completion of the work, or to save harmless the Corporation in case of failure, a certain amount is retained by the Engineer. There is necessarily a large amount of clerical labor devolving upon the Engineer. Correspondence must be had, copies of which are retained in his office; accounts of all money received and disbursed there must consume considerable time. His extended line of road requires him frequently to be from home, and hence much time must be expended in travelling.

The Committee also inquired into the character and amount of labor devolving upon the agent and his assistant. Their principal duties relate to land damages, though these are not by any means their only duties. The general plan of operations in relation to land damages is this. The agent goes over the line, and ascertains the names of the land owners, and obtains a release of the land in all cases where it is practicable before the location is made. But in most cases this cannot be done; in which event the agent goes over the road, measures the length of each man's land on the line of the road, ascertains the width of the location at all parts, and then commences a negotiation with the land owner. This requires much time and patience. The first attempts to negotiate generally prove abortive. Land owners, for the most part, are unwilling that their farms or lots should be cut up, and it generally so happens that the road, in their

estimation, crosses their land just where they are the most unwilling to part with it. It is a new subject to them; they are not prepared to act then; they want a little time to consider of it—to see how they are to be affected by the road, or to ascertain what damages their neighbor obtains. Their tale of grievances must be listened to; the descent of the property, the productiveness of the soil, the richness of the corporation, the arbitrary character of the law by which the Corporation are authorized to take the land of the citizen without his consent—all these and many other things must be related, and heard to, with a great degree of patience; and then, after spending an hour or two, the agent is told that he will do nothing at that time; if he will call again he will talk with him on the subject. Or, if terms are offered by the land owner, they are generally so high that they cannot be complied with. Visit after visit must generally be made before the negotiation can be closed:

In this way much time must be spent, and but little is brought to pass. If some are more reasonable and agree at once, others are more unreasonable and will not agree at all. In such cases, after a fruitless negotiation, the County Commissioners must be called upon to appraise the damages; this, perhaps is followed by an appeal to a Jury. In all such cases the agent, or some one authorized by him, must be present, and to present the case to the Commissioners or Jury. It also frequently happens, that the owner lives at a distance, or that the land is held in common by a number of individuals, or is in the hands of Guardians, or Administrators, or Trustees, all of which circumstances impede the negotiation, and increase the labor of the Agent.

Another no inconsiderable amount of labor connected with this business, relates to the titles of the land. The Agent, in all doubtful cases, examines the records to see if the land is free from incumbrances, and to ascertain in whom the fee is. After he is satisfied on these points, and the negotiation is closed, the Agent makes out a Deed of the land taken, and has it recorded in the Registry of Deeds for the County where the land is situated. These deeds are very minute, describing the land by the foot, and occupy two or three times the space of ordinary Deeds.

This branch of the Agent's business is of the most perplexing character, and must necessarily consume much time. It is also important to the Corporation, that it should be managed with great caution and prudence, and, consequently, with much delay. The saving to the Corporation of a cattle culvert, or a farm bridge, will generally more than compensate for weeks of time spent in negotiation. And experience has shown, that negotiations, though protracted, are to be preferred on the ground of economy, to the calling out of the Commissioners.

The crossing of highways, in some cases, imposes considerable labor upon the Agent. When the highway is to be raised or lowered, or its location to be changed, the Selectmen or Commissioners are to be called upon, and the case is to be decided after a hearing of the parties. The Agent performs the professional duties for the Corporation,—such as appearing before the Commissioners, Juries, and the like. The negotiation which has been going on in relation to the Pontoosuc Turnpike, has occupied some of the Agent's time. He also, as we have before remarked, makes in connection with the Engineer, all the contracts for the grading of the road, and the purchase of lumber for bridges and for the superstructure of the road. The contracts for lumber have, in most cases, been made at a distance. The inhabitants on the line of the road, supposing the Corporation to be within their power, have generally, it is thought, been somewhat exorbitant in their demands for lumber. This has subjec-

Rail-road, and that this union would be effected within one year from the time of our first organization, it was expected that it would be unnecessary to render any report at this time. Our charter was obtained for the purpose of extending the Hudson and Berkshire Railroad to the village of West Stockbridge, so as to complete the line of communication from the Hudson river to the county of Berkshire. From the first, it was apparent to all that the West Stockbridge Railroad, in order to be profitable to the stockholders and useful to the public, must ultimately be united with the Hudson and Berkshire road, and resolutions were early passed by both boards declaratory of the intention of the companies to form this union, so soon as permission could be obtained from your honorable body. We have consequently purchased no cars, engines, or other appurtenances for our road, but have permitted the Hudson and Berkshire Corporation to run their engines and cars over it, without any definite arrangement as to its use, except that the whole matter stands referred for the action of a committee from both boards of directors, when permission is granted to unite the stocks. We entertain the hope, that your honorable body will consider the above reasons why a more detailed report could not be rendered as satisfactory.

The whole amount of our subscription in Berkshire county, is	\$13,900 00
A bond obligating the Hudson and Berkshire R. R. Co. to subscribe	7,500 00
	<hr/>
	\$21,400 00
The directors have received from the Berkshire subscription,	\$6,595 00
Advanced by the directors,	2,981 25
	<hr/>
	\$9,576 25

The Hudson and Berkshire Rail-road Corporation have furnished the whole superstructure, and have laid down the same. They have also commenced a stone building, now nearly roofed in, 100 feet by 50, intended for the depot. They have, in addition, commenced filling in some low grounds around the eastern terminus of the road, in order to render it more commodious.

No account has been rendered by the Hudson and Berkshire Railroad Corporation of the expense of these several operations, and we can therefore give no statement in regard to it.

We have expended for grading and bridges,	\$8,695 85
" " for land damages, fencing, engineering, and incidental charges,	868 91
	<hr/>
	\$9,564 76

The length of the road is 2 3/4 miles nearly. The roadway is graded to a width of 14 feet at top. The superstructure consists, first, of a sub sill, 10 in. by 4 in.; second, of ties about 6 in. by 7 in.; third, of rails 6 in. square; fourth, the iron bar; 2 1/2 in. wide by 5/8 of an inch thick. The timber is principally chesnut, the production of the surrounding country.

The chief engineer, who resides at Hudson, has, within a few days, sent for the maps and plans belonging to the company, and we cannot, therefore, at this time, comply with the statute in regard to the planes and

ted the Agent to the necessity of seeking supplies at a distance. He has, also, in several cases, purchased land with wood standing thereon, for the purpose of obtaining lumber cheaper than it could be bought of individuals.

The office labors of the Agent are very considerable. His correspondence must be somewhat extensive, all of which is a matter of record; the receipts and expenditures of the department, must all be recorded; abstracts of all contracts are entered in a book kept for that purpose, and copies of them are furnished to the Engineer and to his assistant on the part of the road to which they relate. These, together with the deeds, releases, &c., make a large amount of clerical labor. The Committee examined the books and papers in the Offices of all the Departments, and found them neatly, and, as far as they could judge from a very cursory examination, correctly kept.

On the whole, the Committee are fully satisfied, that there is business enough in each of the Departments, to engross the whole time of the several Officers employed, and in the Agent's Department, extra labor, at times, is indispensable.

Nor are the Committee aware, from any thing they could discover, or learn from others, that any of these Officers were neglectful of their duties. They were, on the contrary, pleased with the active business talents exhibited by the different Officers. And, from inquiries made of individuals on the line of the road, they learned that there was an impression among those who had done business with him, that the Agent was active and shrewd, and managed the business of his Department wisely for the Corporation. The committee believe, from what they have been able to discover, that they can congratulate the Board and Corporation, upon their good fortune in selecting wise, judicious and faithful Officers in all the Departments of their business.

One branch of the order required the Committee to examine the manner of the fulfilment of contracts. We are not exactly aware of the import of these instructions. We have already stated, that the contracts for grading and masonry, are to be fulfilled to the acceptance of the Engineer. The contracts for sleepers, &c., require that they should be certain kinds of wood, and of a given size; the contracts for land are fulfilled by the giving of a deed. If this is what was contemplated by the order, we have complied with its provisions. But if it is intended that the Committee should examine, personally, the work in the one case, and the materials in the other, they have not done it to any considerable extent; nor can it be done until the work is accomplished, and the materials delivered. Wherever the work was finished, it appeared to be of the most substantial kind, and executed in the best manner.

Having stated thus minutely the result of their inquiries, the Committee submit the whole subject to the consideration of the Board.

CHARLES HUDSON, } Committee.
AMASA WALKER, }

First Report of the West Stockbridge Railroad Corporation.

To the Honourable the Legislature of the State of Massachusetts :

The Directors of the West Stockbridge Railroad Corporation do hereby make their First Report of their acts and doings, under their act of incorporation, so far as their peculiar position will admit.

This company was organized, under its charter, on the twenty-sixth day of April, 1838, and, supposing that your honorable body might give us permission to unite our stock with that of the Hudson and Berkshire

curves. The road, however, is nearly level, and there is probably no curve with a radius less than two thousand feet.

All which is respectfully submitted.

CHA'S. B. BOYNTON,
ERASTUS CROCKER,
DANIEL SPENCER, JR.
SYLVESTER SPENCER,
HUBBARD FOX.

West Stockbridge, January 28, 1839.

The Genesee Valley Canal—Report of the Canal Board.

The Canal Board, who were directed by the resolution of the Assembly passed the 12th of April, 1839, to report whether any and what alteration can be made in the plan of constructing the Genesee valley canal, which will lessen its cost, without impairing its usefulness, respectfully report—

The subject of enquiry is naturally divided by the terms of the resolution into two branches—the one embracing the cost, and the other the usefulness of the Genesee valley canal. The object of that work is to connect the Erie canal at Rochester with the Allegany river at Olean, and to accommodate the business of the country intervening between those points. To obtain a proper understanding of the cost and of the usefulness of the canal, it will be requisite to take into view some of its leading physical features.

The main line from Rochester to Olean is 106 miles long, and it has a branch nearly 11 miles in length, which diverges to the village of Dansville, from a point in the main line near Mount Morris, and distant about 40 miles south of Rochester. The route pursues, for the greater part of its length, the valley of the Genesee river and one of its tributaries, but its different divisions are singularly diversified in their topographical character.

The head waters of the Genesee, gathered in the mountain districts of the upper part of Pennsylvania, flow into this State in a northerly direction, and across the elevated lands in the county of Alleghany at a height varying from 1000 to 1500 feet above tide-water. After passing with a gradual descent nearly through that country, its waters are suddenly precipitated upon the lowland district traversed by the Erie canal, through a succession of cataracts and rapids which extend northwardly for 17 miles from Portageville, and terminate at Mount Morris. From that point northwardly to Rochester, the descent of the river again becomes gentle, so that its bed at Mount Morris is not elevated more than seventy-five feet above the level of the Erie canal at Rochester.

The Genesee Valley Canal partakes of the irregularities which are occasioned by these abrupt transitions in the character of the river. For the first 36 miles after leaving Rochester, it passes through the rich level low-land district lying in the valley of the Genesee, between the Erie Canal and Mount Morris, and it attains the latter point by a lockage of only 95 feet divided into ten locks. But immediately on leaving Mount Morris, the character of the canal undergoes a great and sudden alteration. For nearly 17 miles south of that place, the bed of the river is confined within a precipitous and rocky defile, varying from one to four hundred feet in depth, which has been worn by the stream in its rapid descent from the upper country—and it becomes necessary to overcome this abrupt change of level, by very numerous locks, and by a tunnel and other expensive excavations. After surmounting this gorge, the canal finally attains its

summit level upon the elevated table land in the county of Alleghany, which separates the waters flowing Northwardly into Lake Ontario, from those descending Southwardly into the Alleghany river. The summit is 11 1-2 miles long, and from its Southern extremity the canal descends, for 10 miles, down a gentle declivity to Olean. The Northern extremity of the summit is distant some 50 miles South from Mount Morris, and it is elevated 978 feet above the level of the Erie Canal at Rochester.

From this sketch of the line, it will be apparent that the principal physical difficulties which the work is obliged to encounter, are found on the middle division of the canal, of fifty miles in length, lying between Mount Morris and the summit. The lockage of the whole canal (excluding the 83 feet on the Dansville branch) is 1063 feet, and exceeds the total lockage of the Erie Canal by 395 feet, and of this amount, 889 feet are contained on the middle division.

The cost of the canal (excluding \$314,520 43 for the Dansville branch) is estimated by the Canal Commissioners in their recent report, (Assembly Documents of 1839, No. 360,) at \$4,585,602 36, and of this amount \$2,928,046 is the cost of the middle division.

The question now presented by the resolution of the Assembly, is whether the cost of this canal can be lessened without impairing its usefulness?

The usefulness of the work will consist either in affording tolls to the public treasury, or in cheapening the cost of transportation. The terms of the resolution of the Assembly will, therefore, virtually exclude any plan of alteration which would materially lessen the revenues of the canal, or enhance the expense of using it.

The canal board are not possessed of all the facts necessary to enable them to estimate with sufficient certainty the future revenues of the canal. They fully appreciate its value to the interesting section of the State whose resources will be developed by its completion. In respect, however, to the tolls to be derived from it in the present state of the navigation of the Alleghany river, the board would observe, that in the year 1835, Frederick C. Mills, Esq., the engineer who surveyed the route, submitted an estimate to the canal commissioners of its probable revenues, (Ass. Doc. of 1835, No. 264, page 42,) in which he computed the tolls, independent of its probable contributions to the Erie canal, at \$39,129 60. Of this amount, \$13,207 was estimated for the tolls on the finer quantities of lumber and other products of the forest, which, it was supposed, would seek the New York market in preference to that on the Ohio and Alleghany rivers. A majority of the canal commissioners, (including the late acting commissioner on that canal,) in the report above referred to, have expressed their belief that the amount of \$39,129 60, thus estimated, is "greater than will be realized for at least the first few years after the canal is completed."

Although the other members of the Board are not prepared to dissent from the opinion thus expressed, yet for the purposes of the present inquiry they will assume that this estimate of revenue is not exaggerated, as it will afford some criterion by which to judge of the quantity of transportation which the canal may be expected immediately to accommodate. The table of annual tonnage from which the above mentioned estimate of revenue was deducted, exhibits a quantity varying not much from 75,000 tons, being about one-tenth of the tonnage of the Erie canal, and one-fourth of that of the Champlain canal.

The probable amount of transportation to be expected on this canal becomes important to the present inquiry, because it will affect the question as to the degree of durability necessary to be given to the locks and

other mechanical structures. It will readily be perceived that in constructing a work like the Erie canal, upon which the lockages last year were 25,962, being an average of 114 daily for the 228 days of navigation and where every interruption, even for the purposes of repair, is to be carefully avoided, it would be expedient and proper to impart much greater strength and solidity to the locks and other structures, than upon a lateral canal, like that under consideration, where, if the above estimate of its business be correct, not more than 10 or 12 boats would daily pass the locks.

By inspecting the profile of the Genesee Valley canal, it is apparent that a large amount must necessarily be expended in constructing its locks, which are 114 in number. To this branch of the work, the Board have therefore directed their particular attention, and they have inquired whether some change may not be made in the plan heretofore prescribed for the canal, which will lessen the heavy expense in which the State must otherwise be involved. A letter has been addressed by the present acting commissioner on that canal to the chief engineer, Mr. Mills, and a copy of his answer is hereunto subjoined, from which the following facts will appear, to wit:

1. The total cost of the 114 locks upon the present plan will be \$1,574,095 50, or \$13,807 86 each.

2. The 10 locks between Mount Morris and Rochester, will cost \$171,901 10, or \$17,190 11 each; and it is ascertained by the Board, that the 17 locks next south of Mount Morris will each cost somewhat more than the sum last named.

3. Of the 114 locks, 81 are to be built of stone, and the remaining 33 are to be of the kind termed "composite" being composed of stone faced with timber.

4. The locks on the Chenango canal, which are 114 in number, are (with the exception of five stone locks) all of them composite. They were built under the direction of Mr. Bouck, one of the present Canal Commissioners, and their average cost was \$3,808 50 each.

5. The 35 composite locks on the Genesee Valley canal, will cost \$8,684 60 cents each. But the engineer accounts for the difference between their cost and that of the locks on the Chenango Canal, by stating that they have three feet more lift than the latter, that they are to be more perfectly constructed; and that there has been a general enhancement in the price of provisions and labor, since the completion of the Chenango Canal, varying from 40 to 50 per cent.

6. The timber work of a composite lock will not need to be replaced more frequently than once in twelve years—and the annual repairs in the meantime will be small, amounting, in the opinion of the engineer, to twenty dollars for each lock; although he states that the actual cost of repairing the composite locks on the Chenango canal during the last season did not exceed five dollars each.

The total cost of replacing the timber portion of a composite lock will be about \$900—and an abundant supply of timber suitable for the construction and maintenance of composite locks can be found near the line of the canal.

7. It is believed that stone of the proper quality for stone locks is only found on that portion of the canal between Mount Morris and Rochester, upon which the ten locks above mentioned are situated, and the canal commissioners, in their report (No. 360) above referred to, express an opinion that "between Mount Morris and Portageville there is no stone suitable for the face of locks, and that the same remark applies to the line at the summit level to Olean."

The locks being 114 in number, and surmounting an aggregate elevation

of 1146 feet, their average lift is 10 feet. The average lift of the locks on the Chenango canal is only nine feet; so that in comparing the cost of the locks on the canals, one-tenth must be added for the increased lift of them on the Genesee Valley Canal.

Upon these facts the Canal Board think it must be apparent that a material reduction can be made in the cost of the locks on the Canal in question.

The average cost on the composite locks on the Chenango Canal was

\$3,808 50

To which add one-tenth for one foot additional lift,

380 85

\$4,189 35

Add for enhancement of prices of labor and provisions since the completion of the Chenango Canal, say 45 per cent

\$1,884 60

\$6,073 95

At this rate 114 composite locks on the Genesee Valley Canal would cost (\$6,073 95 by 114.)

\$692,430 30

But upon the plan now in progress of building 83 stone locks and 32 composite locks, (the latter costing \$8,684 60 each,) the expense will be

\$1,574,095 50

Showing a difference of

\$881,665 20

In case, however, it should be deemed expedient to build composite locks on this canal, of a quality superior to those on the Chenango canal, and similar in plan to the 33 composite locks now under contract, then the cost of 114 such locks would be (\$8,684 60 by 114.)

\$498,044 40

Cost of continuing the present plan as above

\$1,574,095 50

Difference of outlay,

\$584,051 10

In respect to the future cost of maintenance, the account would stand:

To replace the timber work of 114 composite locks at \$900 each, (although the Board are inclined to think this charge too high,)

\$102,600

But the saving of simple interest at 5 per cent for 12 years, on the difference first above stated of \$881,665 20, would be

\$529,067

Or on the difference secondly above stated, of \$584 051 10, it would be

\$370,430

Leaving a gain, after replacing the timber work in the first instance, of

\$426,400

And to the second instance, of

\$267,830

It is proper, however, to state, that the ten stone locks between Mount Morris and Rochester, (and now in progress at a cost of \$17,190 11 each,) are already so nearly completed that they cannot be changed with advantage; and some of the Board are of opinion that on this section of the line, where stone of proper quality is easily obtained, stone locks should have been constructed in any event. The saving, therefore, which is to be effected by changing the plan of locks, will not include the ten locks north of Mount Morris, and the total amount to be saved will thereby be diminished from 90 to 110,000 dollars. But as to the remaining 94 locks south of Mount Morris, the Board are of opinion that the change should be made which is above recommended, although it is the opinion of some of the members that if stone of a suitable character could be obtained near the work, stone locks even on that portion of the line, might be constructed with advantage.

(To be continued.)